

## **4.0 UPT/PCS CALL TYPES**

UPT/PCS involves three distinctly different types of calls. These are described in this section.

### **4.1 Transaction Calls**

In this call type the UPT/PCS user directly interacts with the database of the subscribed UPT service provider in order to update his/her service profile.

The call typically consists of four stages:

- dialing and routing through the PSTN to reach the database or service profile manager;
- interaction (handshake) to validate caller identity;
- service profile update (e.g. updating service/routing of incoming call instructions; etc.)
- verification of update and disconnect.

This call type is not covered in this TR. However, the first stage of the call would typically require the use of a standard North American Numbering Plan (NANP) PSTN number supplied by the service provider to reach the database/service profile manager. The second and third stages (handshake/interaction) are the purview of the service provider and therefore are not subject to standardization.

## 4.2 Outgoing Calls

This call type provides the UPT/PCS user with the capability of temporarily establishing personal billing and service access from any given network terminal. It involves a three step transactional sequence, which is followed by the placement of one or multiple calls into the network. The first phase is as follows:

- establish a connection through the network (PSTN) with the UPT/PCS user's service provider as agent;
- validation/authorization process;
- establishment of a temporary billing/service arrangement for a "set" of outgoing calls from a terminal or location. A "set" of outgoing calls may consist of a single call, a sequence of calls (e.g. 5) or a fixed or open time period for which outgoing calls may be placed.

The second phase of this call type involves the placement of a call or calls by the UPT/PCS user from the chosen terminal(s). These calls are established using standard network addressing and routing procedures.

The procedures used in the initial phase of the outgoing call set up (transactional sequence) are service provider defined and are not subject to standardization.

### 4.3 Incoming Calls

This call type involves the establishment of a communication between a caller, typically POTS, and the UPT/PCS user over the public switched telephone network (PSTN). Note that this is the only UPT/PCS call type that this TR is intended to cover.

The basic addressing and call set-up procedures are as follows:

- the caller dials the UPT/PCS user's personal number (the 10 digit, 3 + 3 + 4 formatted E.164 NANP number);
- the network (PSTN) establishes a connection with the UPT/PCS user's service provider's database. The number will indicate which network translation techniques are used to route the call. Calls may be physically routed to the database or held while signalling messages are used to establish the destination instructions;
- the service provider's database supplies the current destination terminal number (DTN) as designated by the UPT/PCS user;
- the network completes the call to the destination terminal number (DTN). Note that the DTN is the physical network address of a network terminal, voice mail facility, answering service, etc. The DTN is also referred to as the routing address.

## 5.0 UPT/PCS NUMBER STRUCTURE

In order to provide a seamless addressing scheme which is immediately implementable, the World Zone 1 UPT/PCS number structure shall be consistent with CCITT Rec. E.164 (Numbering Plan for the ISDN Era) as is currently implemented in World Zone 1 - specifically the North America Numbering Plan (NANP). The UPT/PCS number structure will therefore consist of 10 digits in the form:

NPA	NXX	XXXX
3 Digits	3 Digits	4 Digits

Further, the UPT/PCS numbering structure in World Zone 1 will adhere to CCITT Rec. E.168 (Application of Rec. E.164 Numbering Plan for UPT) and provide for different implementations of UPT/PCS within World Zone 1. Specifically the home-based and country-based schemes will be provided for initially. The global scheme, by definition, will require complex international agreements and will not be provided in the initial UPT/PCS implementations.

The number structure for the home-based scheme will consist of a geographic NPA code followed by a standard 7 digit subscriber number (SN).

	Subscriber Number (SN)	
	-----	
NPA	NXX	XXXX
3 Digits	3 Digits	4 Digits
	(Central Office Code)	(Line Number)

The UPT/PCS identifier will be contained within the 7 digit subscriber number.

The number structure for the country-based scheme will consist of a non-geographic Service Access Code (SAC) followed by 7 digits which form the subscriber number.

Subscriber Number (SN)		
SAC	NXX	XXXX
3 Digits	3 Digits	4 Digits

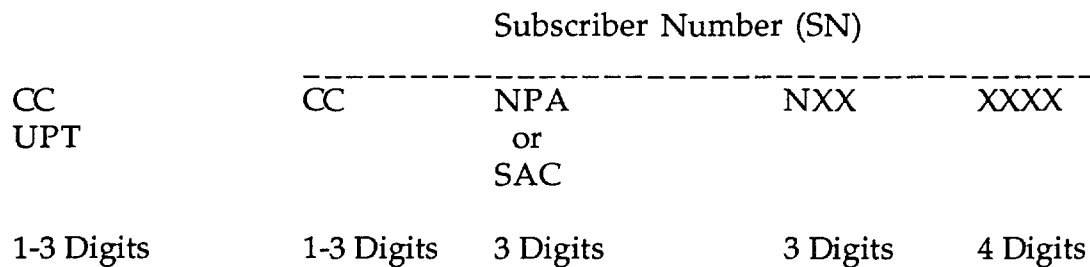
UPT/PCS "identity" will be accomplished through the assignment of unique SAC(s) to the UPT/PCS application in World Zone 1.

Initially, service provider identification will be achieved through the assignment of unique Service Provider Code (SPC) NXX codes as follows:

Subscriber Number (SN)		
SAC	SPC	
NXX	NXX	XXXX
3 Digits	3 Digits	4 Digits

Eventually, network evolution required to support number portability between service providers will be developed. This will eliminate the need for SPC NXX allocation and enable permanent assignment of unique 10 digit numbers to UPT/PCS users.

The number structure for the global-based scheme will consist of a global Country Code (yet to be identified), indicating the number is a UPT/PCS number, followed by the current CCITT assigned country code and a 10-digit NANP number. The NANP number may take the form as described in the home-based scheme or country-based scheme.



The global-based scheme will require international agreement for the assignment of a country code, by CCITT, for UPT/PCS services. Given the dependency on the international agreements required to use the global scheme, this scheme is considered as an item for a future report.

## 6.0 HOME-BASED NUMBERING SCHEME

### 6.1 Description

For the purpose of this Technical Report, the following describes the Home-based Numbering Scheme. In the Home-based Numbering Scheme UPT/PCS service coverage is limited to a geographic area (e.g. city, state, LATA, NPA). This implies that some PCS functionality for calls to, or from, the user would not be supported outside the pre-defined serving area. Calls to the user from non-PCS users located outside the serving area would be completed according to the UPT/PCS user's instructions.

### 6.2 Home-based Numbering Structure

In this scheme the UPT/PCS number is a geographic NANP number. For this scheme, the numbering format as depicted in Section 4 may be interpreted as:

NPA	NXX	XXXX
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Where "NPA" is the geographic numbering plan area; "NXX" (central office code) and "XXXX" form the UPT/PCS subscriber's number.

### 6.3 Home-based Addressing

The following table provides examples of addressing details for all Home-based call types.

Type of call	Prefix	CC	NPA	NXX	LN#	UPT	SP	Total
						ID	ID	Digits
								Dialed
Local								
Direct Dialed								
(HNPA)				234	5678	NXX-	NXX-	7
						LN#	LN#	
HNPA	<1>		708	234	5678	NXX-	NXX-	10<11>
						LN#	LN#	
Toll								
Direct Dialed								
(HNPA)				234	5678	NXX-	NXX-	7
						LN#	LN#	
HNPA			708	234	5678	NXX-	NXX-	11
						LN#	LN#	
FNPA			206	345	6789	NXX-	NXX-	11
						LN#	LN#	
International								
Direct Dialed								
Australia, Melbourne	011	61	3	670	2562	NXX-	NXX-	13+
						LN#	LN#	
Operator Assisted								
National								
HNPA	0		708	234	5678	NXX-	NXX-	11
						LN#	LN#	
FNPA	0		206	345	6789	NXX-	NXX-	11
						LN#	LN#	
Operator Assisted								
International								
Australia, Melbourne	01	61	3	670	2562	NXX-	NXX-	12+
						LN#	LN#	

TABLE 1 - Home-based Addressing



## 6.4 Home-based Routing

Incoming call routing in the Home-based scheme follows the basic two-stage routing technique required for any UPT/PCS call (Ref. Section 4). That is: an initial connection to the UPT/PCS user's service profile to obtain the current destination terminal number (DTN), and, completion of the call to the DTN. It should be noted that due to the local nature of the Home-based scheme the service provider's database and the terminating number (DTN) would typically be located within the Home serving area.

- Calls Originating in a Foreign NPA

Calls originating from the PSTN in a Foreign NPA would not be recognized as PCS calls and traditional call routing from the originating network to the geographic NPA dialed would occur. Specifically, a 10-digit geographic number is dialed and the network routes the call to the destination NPA. Within the destination NPA the NXX-XXXX code is recognized as being associated with PCS and identifies a PCS Service Provider (PSP). The call is routed to the associated PSP's switching entity and a query is launched to the PSP's database to interrogate the subscriber's service profile to obtain the current destination terminal number specified by the PCS subscriber in their service profile.

specific NXX routing requirements must be negotiated and implemented before service can be established.

**Note 4** The Home-based scheme anticipates a restricted geographic service area, and therefore all calls are automatically calls routed to that geographic serving area. Calls completed within the serving area are routed relatively efficiently, however, if the UPT/PCS user is having calls routed to a DTN outside the serving area, significant routing inefficiencies may occur (Ref. Note 5).

**Note 5** From a network perspective the Home-based number scheme only enables UPT/PCS identification within the home serving area. All network components within the home area must be able to recognize the UPT/PCS call to the extent required to route it to the PSP's information database. Calls to the Home-based UPT/PCS number from points outside the home serving area will not be recognized as being UPT/PCS.

**Note 6** The Home-based scheme will use geographic NPA numbers. The current administrative procedures will apply to or be modified to take into account UPT/PCS Home-based numbering.

**Note 7** The Country-based plan is based on UPT/PCS SAC(s). Assignment of resources from these SAC(s) must be centralized. Industry approved UPT/PCS N00 NXX Assignment Guidelines are currently under development (Industry Carriers Compatibility Forum - ICCF). These assignment guidelines will initially deal with the assignment of N00 NXX

codes to identify Service Providers. It is recognized that the advent of UPT/PCS number portability will require new administrative guidelines to account for the assignment of the full 10 digit (SAC NXX XXXX) numbers to UPT/PCS users.

**Note 8** Both the Home-based and Country-based plans are considered to be adaptable to long terms needs as the growth potential of both plans is limited only by the availability of relief NPA's (640 additional NPA's available on 1-1-95).

COMMITTEE T1 - TELECOMMUNICATIONS  
STANDARDS CONTRIBUTION

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STUDY PROJECT: T1P1 Personal Communications

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TITLE: Comments on the UPT "Extended NANP" Prefix Plan

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ISSUES ADDRESSED: This contribution highlights certain issues USTA feels should be understood by the industry regarding the adoption of the "Extended NANP" prefix plan as described in T1P1 document T1P1.3/92-115 attachment C generated at the last T1P1 meeting held April 20-24, 1992, in Dallas, Texas.

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DATE: July 27, 1992

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DISTRIBUTION TO: Working Group T1P1.3

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NOTICE

This contribution has been prepared to assist Accredited Standards Committee T1 - Telecommunications. This document is offered to the committee as a basis for discussion and is not a binding proposal on USTA. Any requirements stated herein are subject to change in form and numerical value. USTA reserves the right to add to, amend, or withdraw the statements contained herein.

## COMMENTS ON THE UPT "EXTENDED NANP" PREFIX PLAN

### PURPOSE

The purpose of this contribution is to highlight certain issues USTA feels should be understood by the industry regarding the adoption of the "Extended NANP" prefix plan as described in T1P1.2/92-115 att. C generated at the last T1P1 meeting held April 20-24, 1992, in Dallas, Texas.

USTA believes that the "Extended NANP" prefix plan will result in customer confusion, additional unwarranted cost to the industry and the public, unnecessary network architectural changes, as well as being contrary to established agreements reached in T1P1.3 on UPT numbering issues. Adoption of such a plan may benefit a segment of the industry who may easily incorporate technical changes to their equipment, however, the great majority of local exchange carriers will be burdened with unnecessary modifications to their networks.

### THE "EXTENDED NANP" PREFIX PLAN IS NOT AN EXTENSION OF THE NANP

The "Extended NANP" Prefix Plan is misleadingly labeled. It is not an extension of the NANP, but a new numbering plan that looks confusingly similar to the NANP. The proposed dialed "UPT Prefix" is nothing more than an escape code, moving the user from the NANP to a new numbering plan.

T1P1.3 has concluded at past meetings that the NANP should be used for UPT service in WZ1, since the NANP is consistent with E.164 and draft standard E.168. No justification has been documented, either nationally or internationally, that would support the need to create a new numbering plan to accommodate UPT.

### SWITCH MODIFICATIONS REQUIRED

The use of an eleven digit numbering plan domestically will necessitate modifications to existing switching equipment for every exchange wishing to support the "Extended NANP" prefix plan. These changes will also be required to support the fourteen digit dialing requirement of the "Extended NANP" prefix plan. For calls to countries outside of World Zone 1, up to fifteen digits may be required. This will also necessitate switching equipment modifications.

The "Extended NANP" prefix plan will require additional (for the LEC industry) switch logic to recognize the prefix, examine the first 1-3 digits to determine the country code and route the call appropriately. Since the "Extended NANP" prefix plan number starts with a one "1", this could cause a potential problem for telephone switches. The one which forms the first digit of every "Extended NANP" prefix number must be differentiated from the one dialed as part of the normal dialing plan for ten digit NANP calls (which tells the switch that ten digits are to follow). This additional usage of the numeral "1" in this way has the possibility of confusing both users and switching equipment. In addition to the switch modifications that will be required within WZ 1, foreign RPOAs may have to modify their switch operations to accommodate these non-standard numbers being dialed from within their countries.

**SERVICE PROVIDER IDENTIFICATION AND LACK OF NUMBER PORTABILITY**

The "Extended NANP" prefix plan will lead to inefficient usage of numbering resources due to the inclusion of service provider identification within the number. Following the country code, the "Extended NANP" prefix plan incorporates a service provider code. This code may be three or more digits in length. The inclusion of such a code within the number will create reserved numbering space for given UPT providers that will not be portable between providers. The public will be forced to change their UPT number if they wish to change service providers, until a nationwide database scheme (ala 800) is implemented. There has been no time frame referenced as to when the "Extended NANP" prefix numbering resources would become part of a nationwide data base access scheme.

If three digits are used for the service provider identification, then 1,000 UPT providers can be supported each having 10 million numbers at their disposal. If four digits are used, then 10,000 providers can be supported and they will have up to 1 million numbers that they can allocate. If each member of USTA were to request a service provider code, then four digits would be required (since there are over 1,000 members).

The Long Range Numbering Plan recently recommended by the NANPA does not support the concept of service provider identification within a numbering plan. USTA has supported that point of view, and feels that service provider identification should not be within the UPT number, rather it should be located in an industry accessible data base look up. USTA also feels that allocating 1-10 million numbers to any particular UPT provider would lead to very inefficient usage of numbering resources.

**HUMAN FACTOR CONSIDERATIONS**

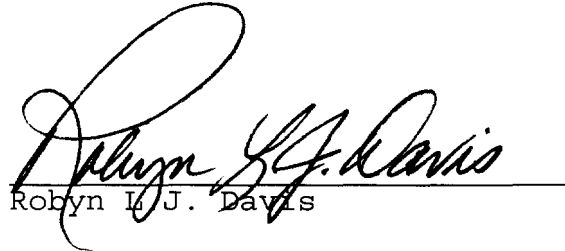
Human factor considerations require serious evaluation with respect to the "Extended NANP" prefix plan. Dialing extra digits to complete UPT calls will take subscribers additional time, increase dialing errors, and demand additional network resources. In addition, the numbers within the "Extended NANP" prefix plan are very similar in format to the NANP. This similarity will no doubt create confusion for subscribers. It will be very difficult to tell the difference between NPA codes and service provider codes, and this is sure to lead to many mis-dialed numbers. In addition, the similarity of NANP and "Extended NANP" numbers means that misapplication of the dialed prefix will result in many misdirected calls. For these reasons, USTA believes that compared to the NANP, the "Extended NANP" prefix plan will contribute to more human factor problems.

**SUMMARY**

For the reasons and examples listed above, USTA is not in favor of the industry adopting the "Extended NANP" prefix plan. USTA recommends that T1P1.3 concentrate on accommodating the UPT numbering requirements of the industry through the scenarios outlined in the existing draft of E.168 per the past agreements reached in T1P1.3.

**CERTIFICATE OF SERVICE**

I, Robyn L.J. Davis, do certify that on February 24, 1993  
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the U.S. Mail, first-class, postage prepaid to the persons on the  
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